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13 MAR 1946

PROCEEDINGS
OF THE
Bournemouth Natural Science Society.

VOL. XXXV.

SESSION 1944-45.

BRITISH MUSEUM

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Bournemouth Natural Science Society.

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SESSION 1944-45.

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BRITISH MUSEUM NATURAL HISTORY

Bournemouth Natural Science Society.

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Astronomical: Instr.-Capt. M. A. Ainslie, R.N., M.A., F.R.A.S.
Botanical: E. Chambers.
Entomological: S. C. S. Brown, L.D.S., R.C.S.
Geographical: F. L. Lowther, B.A., M.B.O.U.
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Microscopical: E. A. Robins, F.R.P.S., F.L.S., F.R.M.S.
Photographic: S. Whitaker.
Physical: W. J. Woodhouse, A.C.P.
Zoological: Mrs. W. Boyd Watt, M.B.O.U., F.Z.S.

Hon. Treasurer

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Hon. Secretary: F. Broad, F.S.I.
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Hon. Editor

Miss M. Penrose, B.SC.

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J. F. N. Green, B.A., F.G.S.

Hon. Auditors

F. Broad, F.S.I., E. McMichael.

Bankers

National Provincial Bank of England, Bournemouth.

Introductory Note.

During the *Winter Session* from October to April, *General* and *Sectional Meetings* are held, comprising Lectures and Demonstrations on subjects of scientific interest, illustrated by lantern slides, diagrams, specimens or experiments.

ALL MEETINGS ARE OPEN TO ALL MEMBERS OF THE SOCIETY.

Throughout the *Summer Session, Excursions* to places of interest in the neighbourhood are arranged, and indoor or garden meetings occasionally held.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting, held in October.

The Society possesses a Library available for the use of members. Books may, under certain conditions, be borrowed by members, and there is a Reading Room in which works of reference may be consulted.

Members are elected by the Council and pay an annual subscription of £1 for full membership (admitting to all meetings and excursions for the year). A subscription of £2 covers four adult members of the same family residing in the same house.

Notices giving full details of all meetings, etc., are posted to every member, and a volume of Proceedings is published each year.

Application forms for Membership, and further particulars, can be obtained from the *ASSISTANT SECRETARY,* 39, *CHRISTCHURCH ROAD, BOURNEMOUTH.*

The Bournemouth Natural Science Society was founded at the beginning of the present century. Its objects are declared by the second of its rules to be "the promotion of the study of Science in all its branches, by means of Lectures, Field Meetings, the Reading and Discussion of Papers, and the formation of Sections of its members devoted to any particular branch of the Society's work, and in any way that the Council of the Society shall deem advisable."

During the forty odd years of its history the Society has pursued these objects faithfully. From a very small group it has grown into a Society with a considerable membership, a house and garden of its own, and possesses the nucleus of a valuable museum.

In the large and growing town of Bournemouth it remains the only Society where matters of general scientific interest are studied and discussed.

In early days the lectures were given in various rooms in the town, first the Y.M.C.A. (then next to West's Pictures), and later in Granville Chambers; but in 1913 a more dignified home was acquired in the, then newly opened, Municipal College. This consisted of a large room on the ground floor where it was possible to house the embryo library and museum and to give all lectures excepting those at which large audiences were expected.

In 1919, at the end of the First World War, the Society received notice to vacate this room as it was needed by the Education Authority for the use of students. By this time our membership had grown to over 500, and it was clear that no single room would serve. The Council, therefore, endeavoured to find suitable premises in as central a position as possible. It was thus that No. 39, Christchurch Road, came into the Society's possession.

Through the good offices of Rev. C. O. S. Hatton, Sir George Meyrick granted us the freehold of the property, (although this was still subject to certain restrictive covenants). In order to meet the purchase price and the cost of a few necessary alterations, debentures bearing interest at 6 per cent. were raised among the members. Originally £3,340 was subscribed in this way; this sum proved sufficient to cover the whole expense.

The house was formally opened at an At Home in February, 1920, and the membership continued to increase.

For nine years all lectures were given in the room that is now the Museum, but as time went on it became clear that some more adequate hall must be provided. In 1929 the Council recommended that a lecture-hall should be added on to the house and, the members agreeing, the work was put in hand. The new hall and lantern-room were opened in October of the same year, having cost the Society about £1,800. This large sum was partly met by donations from members, by private loans at low interest and by the issue of more debentures, up to the full amount of £3,400.

In December, 1932, by common consent of the debenture-holders, the rate of interest was reduced from 6 per cent. to 4½ per cent., at which it still remains.

To-day the debentures still held by 21 members amount to £3,085, these members are therefore the Mortgagees of the Society's premises.

The result of the recent War has been greatly to reduce our membership, and, as all our members are aware, our overhead expenses are yearly increasing. But already there are signs of recovery.

Council's Report for the year ending 30th September, 1945.

Membership of the Society has increased by 20 during the year, and now totals 394. Seventy-one new members have joined, 28 members have resigned, and 8 have died. Fifteen members have also had to be considered as having resigned owing to failure to pay subscriptions. The Society's membership now includes 2 original members, 12 honorary members, 8 life members, and 10 associates.

The Council has to report with very deep regret the deaths of the following members :—Mrs. Armstrong, Miss Field, Mr. Hornby, Mr. Kerfoot, Miss Lupton, Mr. Marsh, Mr. Spencer and Mr. Stables.

Mr. J. F. Spencer, whose death occurred in January of this year, joined the Society in 1909 and was Assistant Secretary from that date until 1936. He was a Member of Council from 1923-1937. Miss Lupton, who died in November, 1944, was an Original and also an Honorary Member.

There has been only one change among the officers of the Society. Members will be sorry to hear that Mr. L. Beeching-Hall has been obliged through ill-health to resign the Chairmanship of the Botanical Section, which he had filled with such conspicuous success since 1927. His place has been taken by Mr. Ernest Chambers, whose wide knowledge of botany is already known to those members of the Society who have had the privilege of hearing his lectures.

The Society has been well supplied with lectures and excursions during the year. Thirteen General Meetings were held in addition to the Annual Meeting and the Presidential Address, and there were 68 Sectional Meetings. The Presidential Address was given on November 4th, 1944, when the President, Mr. A. S. Hemmy, B.A., M.Sc., read a paper to the Society on "The Nordic Question." On April 28th, the Society had the unusual pleasure of hearing a concert of Old English Music, accompanied by an interpretative paper on the subject. This concert was organised by Miss Parnell Jones for the benefit of the Society's funds, and was very well attended and greatly enjoyed.

The Entertainment Committee provided the Society with a Whist Drive on January 6th, and a Garden Party on July 28th. The Committee has been under the Chairmanship of Mrs. William C. Simmons, who was elected on the resignation of Mrs. James, and the Council wishes to thank its members and all those who have helped them for the hard work which they have devoted to the organisation of entertainments, the proceeds of which have furnished a very appreciable contribution to the Society's finances.

During the summer months, there have been 38 excursions to places of interest in Dorset and Hampshire.

In April, the Council sent a letter to the Wareham District Council supporting the latter's protest against the retention by the War Office of the Purbeck Coast and coastal districts, and the Chairman of Council has had some correspondence with various ministeries on the subject.

It is hoped that the Volume of the Society's Proceedings which is to be published at the end of this year will be slightly larger than that published in recent years.

Members will regret to hear that Mrs. Tongs, who has served the Society so devotedly as Caretaker for 26 years, has been obliged to retire owing to ill-health. The Council has been fortunate in obtaining the services of Mrs. Freeth as successor to Mrs. Tongs.

The Council's thanks are again due to the many donors of books to the Library and gifts to the Museum.

The Council wishes to express its gratitude to the Garden Committee, whose members, led by their Chairman, Mr. H. C. Sadler, have put in many strenuous hours of work in the garden; to the tea Committee, which, under the Chairmanship of Miss Roden, has provided the Society with tea after lectures throughout the year, and has materially contributed to the success of the entertainments; to the lanternists for their continued invaluable help, and to those members of the Society who assisted in the distribution of the Proceedings.

Summary of the Accounts for the Year ending 30th September. 1945.

CURRENT ACCOUNT.

Receipts.

	£	s.	d.	£	s.	d.
Annual Subscriptions to Sept., 1945	323	7	6			
Ditto on A/c, Sept., 1946 ...	15	7	6	338	15	0
Donations :—						
Special Gift to Asst. Secretary's Salary	35	0	0			
Individual Donations	17	14	3			
Entertainment Committee :—						
(a) Whist Drive (*less* expenses)	8	10	0			
(b) Garden Party (*less* expenses)	21	6	1			
(c) Miss Parnell Jones Special Concert (*less* expenses)	10	0	0	92	10	4
Rents from Tenants				158	10	0
A.R.P. Compensation for use of premises				7	13	0
Hire of Garden	1	1	0			
Hire of Room	0	7	6			
Refund on A/c of Gas and Electricity	4	7	0			
Pence for Telephone	2	8	8			
Sale of Lists of Members ...	1	0	0			
Attendance at Lectures	0	10	6			
Royal Empire Society towards cost of Heating	12	0	0			
National Trust Collection ...	1	11	6			
Proceeds of Teas	4	7	9			
Cost of Half Tone Block (Mr. Hemmy)	1	5	0			
Fees for Debenture Transfers ...	0	5	0			
Sundries	1	6	1	30	10	0

Payments.

	£	s.	d.	£	s.	d.
Interest on Debentures due 1st Sept., 1945	139	4	2			
Less Income Tax 10s.	69	12	1	69	12	1
Income Tax, Schedule D ...				0	10	0
Corporation Duty				3	14	6
Maintenance :—						
War Damage	20	10	0			
Property Tax, Schedule A ...	102	10	0			
Rates	87	2	6			
Water	4	13	9			
Gas	19	4	4			
Electricity	6	6	10			
Fuel (Coal, Coke)	38	6	7			
Insurance (property)	20	0	3			
Caretaker's Wages and Insurance	77	3	1			
Garden Wages and Expenses ...	11	0	9			
Telephone	10	13	3	397	11	4
Secretarial Expenses :—						
Salary and Insurance	43	12	3			
Postages	12	2	11			
Printing and Stationery ...	39	9	7	95	4	9
Subscriptions to other Societies ...				0	17	6
Subscriptions to National Trust ...				1	11	6
Return to Royal Empire Society in respect of extra Fuel				2	0	0
Sundries				4	5	0

Cash Balance brought forward from 1944	48 17 10		Cash Balance :—		
Petty Cash brought forward ...	2 15 0		Current Account	99 4 1	
		51 12 10	Petty Cash in hand	5 0 5	
					104 4 6
			Deposit Account, General Fund £106 15 1		
		£679 11 2			£679 11 2

We have examined the above accounts with the books of the Society and the vouchers for payments and certify the same to be correct.

FREDERIC BROAD.
ERNEST McMICHAEL.

Bournemouth, 10th October, 1945.

DEPOSIT ACCOUNTS.

Debenture Fund.	£ s. d.		£ s. d.
Balance brought forward	42 8 11	Balance on Deposit	42 17 3
Interest to December, 1944	0 8 4		
	£42 17 3		£42 17 3

Building Fund.	£ s. d.		£ s. d.
Balance brought forward	34 8 10	Balance on Deposit	34 17 3
Interest to December, 1944	0 8 5		
	£34 17 3		£34 17 3

Archæological Research Fund.	£	s.	d.		£	s.	d.
Balance brought forward	10	7	8	Balance on Deposit	10	9	8
Interest to December, 1944	0	2	0				
	£10	9	8		£10	9	8

Redemption Fund	£	s.	d.		£	s.	d.
Balance brought forward	14	2	3	Balance on Deposit	14	3	7
Interest to December, 1944	0	1	4				
	£14	3	7		£14	3	7

Bournemouth Trustee Savings Bank (General Fund).	£	s.	d.		£	s.	d.
Balance brought forward	103	3	2	Balance on Deposit, Nov. 20th, 1944 ...	106	15	1
Interest to 20/xi/44	3	11	11				
	£106	15	1		£106	15	1

Note.—

The special thanks of the Society are due to the following :—

(a) An anonymous donor for £35 towards the Salary of the Assistant Secretary.

(b) Miss A. Parnell Jones for the proceeds of the Special Concert.

(c) The Entertainment Committee

(Signed) WILLIAM J. WOODHOUSE,
Hon. Treasurer.

30th September, 1945.

Summary of Meetings and Excursions.

N.B.—A detailed report is omitted this year, but one will be placed on view in the Library at 39, Christchurch Road.

General.—Three Meetings, twelve Club Days, a Whist Drive in January and a Garden Party in July.

Archæological and Historical Section.—Eleven Meetings, five Exursions.
Astronomical Section.—Four Meetings.
Botanical Section.—Six Meetings, one Excursion.
Entomological Section.—Six Meetings, one Excursion.
Geographical Section.—Nine Meetings, three Excursions.
Geological Section.—Four Meetings, one Excursion.
Microscopical Section.—Twelve Meetings.
Photographic Setcion.—Five Meetings.
Physical Section.—One Meeting.
Zoological and Biological Section.—Eleven Meetings, one Excursion.
Combined Sectional Meetings and Excursions.—Botanical and Zoological Sections, eighteen Excursions. Botanical and Geological Sections, one Excursion.

Library Report.

The hon. Librarian has much pleasure in saying that members of the B.N.S.S. have very generously presented books to the Library during the last year.

The names of the members giving books are:—Mrs. Bell, Mr. Bickell, Mr. Brown, Mr. Chambers, Mrs. Crallan, Mr. Green, Mrs. Beeching Hall, Mr. Hemmy, Mrs. Jaggers, Mr. Mummery, Miss Penrose, Miss Spencer, Capt. Knapp. A member of the Royal Empire Society has presented about 6 books on various subjects, each being very well illustrated.

The Library Committee has sustained a great loss by the death of Mr. L. Beeching Hall. He was a member of the Committee for 14 years. He was also its Chairman for 3 years.

The Society is greatly indebted to Mr. Baker for fitting up shelves in the Library.

(Signed) S. Whitaker.

Museum Report.

An important acquisition during the year was a fine collection of British Dragonflies, which was mounted for us and kindly presented by Col. Fraser. This filled a much needed want by the Society, and will enable Members to identify such specimens of this active group (*Odonata*) as they are able to catch.

With the help of Mr. J. F. N. Green, our President, we have been able to track down more details of the provenance of specimens of parts of a fossil Mammoth tusk from near Ibsley Bridge, and details of the site of this discovery, made as long ago as 1930, are now shown on the glass specimen case.

W.C.S.

Botanical Section.

Included amongst the Records for 1945 :—

Geaster var. spp.
Azolla Filiculoides.
Pilularia Globulifera.
Panicum Crus-galli.
Leasia Oryzoides.
Carex Limosa.
Scirpus Caricis.
Schoenus Nigricans.
Teesdalia Nudicaulis.
Limosella Aquatica.
Asarum Europæum.

Report of the Entomological Section.

Summary of Observations on Insects in the Bournemouth District during 1945.

This year has been remarkable for the exceptionally large number of rare immigrant butterflies and moths which arrived in this country from abroad.

Not since 1872 has such a migration taken place.

The Bath White Butterfly for example, an exceptionally rare one here, was seen in hundreds all over the Southern Counties.

Papilio machaon, Swallow-tail Butterfly. One caught and some larvæ found on carrot.

Pieris daplidice, Bath White. Several seen and a number bred from ova obtained from captured females.

Colias nyale, Pale Clouded Yellow. A few seen.

Colias edusa, Clouded Yellow. Common.

Lycæua bætica, Long-tailed Blue. Two seen.

Lycæna argiades, Short-tailed Blue. One caught.

Acherontia atropos, Death's Head Hawk Moth. Several larvæ found on potato plants.

Spinx convolvuli, Convolvulus Hawk. Quite common in Bournemouth.

Deilephila livornica, Striped Hawk. Two taken.

Manoglossa stellatarum, Humming Bird Hawk. Has been unusually common.

Plusia gamma, Silver Y. A very strong migration took place.

* NOTE ON SPIDER (*Argyope Bruennichi*).

The Spider found by Mrs. Marshall Bell in 1940, and then identified as an American species, Miranda (*Argyope*) *aurantiaca,* is now stated by Dr. Bristowe (Ann. & Mag. Nat. Hist., Ser. II, vol. 11, p. 839, Dec., 1944) to be *Argyope Bruennichi,* a European and Asiatic species, ranging as far East as Japan. Before 1940 it had only once been found in England (Rye, Sussex, 1922); but it has since been seen by Mr. Beeching Hall at Parkstone, and by Mrs. Bell at Iford.

The male spider was found at Southbourne for the first time in 1945.

* See Vol. XXXIII., p. 26.

Report of the Zoological Section.

BIRD REPORT.

It has not been possible to publish Bird records during the war, owing to pressure on space and the paper shortage, and still, for the latter reason, we cannot publish systematic lists and records of migrants. The latter have been kept however, and some have appeared in the County records.

The Society has undertaken many outings during the war for the special purpose of Bird watching, chiefly on the Stanpit Marshes, Poole Harbour, and the Wareham and Swanage districts.

Perhaps the most interesting birds seen during this time, were the Blue Headed Wagtail and Spoonbills. Both of these species were seen on the Stanpit Marshes, during the excursions.

Other rare birds reported by Members and others are :—the Red-Breasted Snipe (Mudeford, 1943), Ruddy Sheld-duck (Stanpit Marshes, 1943), Osprey (Avon Valley, 1942), Southern Cormorant (Mudeford, 1944), and Arctic Skuas (River Stour, 1943).

Ravens have been reported as nesting on Hengistbury Head for the first time, it is not known how many eggs were laid, but only one was hatched out, and the two adults and the young one were seen many times afterwards flying over the Marshes.

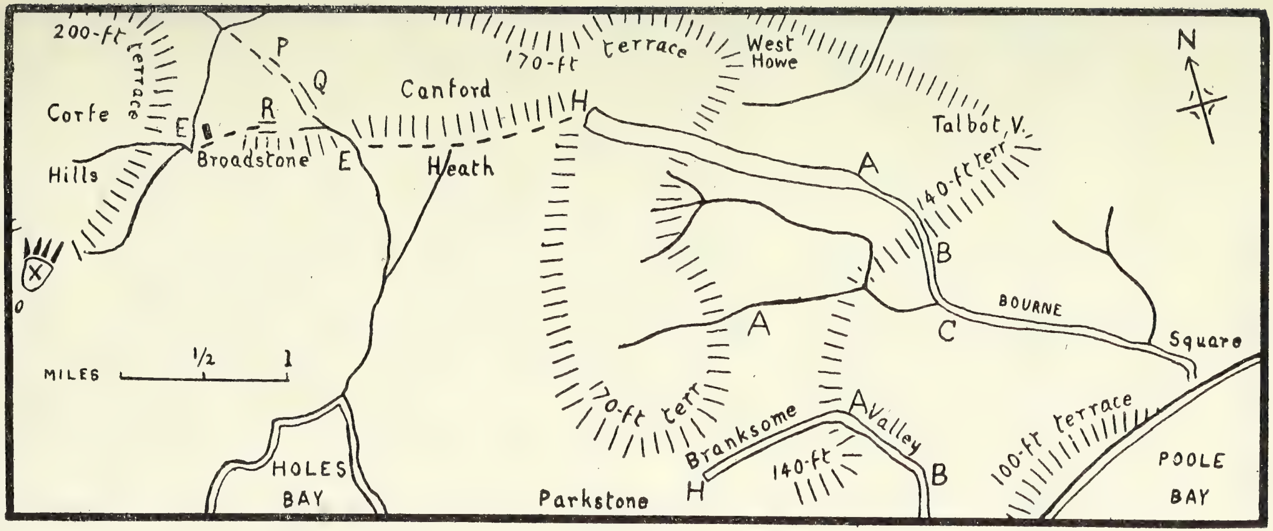
Oyster Catchers also nested in 1943 and 1945 on the top of Hengistbury Head and have greatly increased in numbers.

The cold spell at the beginning of 1945 caused great mortality amongst the birds, Redwings claiming the greatest number of victims. Others included Sky-larks, Pipits, Linnets and Stonechats. Kingfishers also must have suffered greatly as so few have been reported this year.

The following members contributed many interesting notes and lists of migrants :—Mrs. Boyd Watt, M.B.O.U., Mrs. Highway, F. L. Lowther, Esq., M.B.O.U., Miss M. Penrose, Miss Pettito, Miss C. Popham, M.B.O.U., E. Robins, Esq., Dr. K. B. Rooke, Miss D. Smythe, Miss E. Trotter, E. Whitaker, Esq., F. Williamson, Esq.

(Signed) CHRISTINE H. POPHAM.

◆



MAP OF THE BOURNE AREA.

The Bourne and Branksome valleys are indicated by outlines of their floors. Other streams mentioned in the Address are shown by a thick line. The areas, within which parts of the terraces of the Stour and Solent rivers are preserved, are delimited by hatching.

A.—Rejuvenation heads of the Staverton episode. B.—Heads of the Upper Buried Channel. C.—Head of the Christchurch episode. E.—Elbows of capture. P.—Col with fragmentary floor. Q, R.—Fragments of ancient valley floor.

Presidential Address.

The History of the Bourne and its Valley.

By J. F. N. Green, B.A., F.G.S.

The study of rivers and their valleys makes little appeal to most people, even professed exponents of physiography. The reason may be that the principal work so far has been on such giants as the Rhine and the Mississippi. Our rivers near Bournemouth are more manageable. They have given us an unsurpassed series of terraces; the plain at about 130 feet above sea-level on which much of Bournemouth is built and which tops our finest cliffs is a good example of a joint river-terrace; and in the breach by the sea of the old Solent river between the Needles and Old Harry Rock we have a classical illustration of river development. But our rivers are still too large for demonstration in the field.

The smaller brooks have been neglected. But, while studying the valleys of the Stour and of the ancient river which once continued the Frome across the site of Poole Bay through the Solent, I found the history of our little Bourne so interesting and illustrating so well many of the principles of river development that, as the localities concerned were easily reached, it might make a subject, usually thought dull, somewhat livelier.

Most of our Bourne is thoroughly tamed. From its former source, now severed from the main body, and along nearly all its present valley and tributaries, it has been artificially drained and straightened. What was once a marshy bottom with a meandering stream is now a dry floor with a series of drains, which however, being placed at the lowest line of the valley, enable the former course to be approximately determined.

In its existing shortened course the valley of the Bourne is only 5 miles long; and it can be shown that it was never more than 10 miles long from its present mouth at the pier. Three-quarters of a mile above the mouth it divides into two branches, and here too becomes obvious the fact, first observed by Mr. Bury, that the Bourne lies in a valley within a valley. The floor of the earlier valley is still the only floor most of the way. The southern branch rises at Alderney and there is no reason to suppose it ever went farther. The northern branch valley continues to Canford Heath where, as Mr. Bury also showed, it is cut off abruptly.

Where then did the Bourne originally rise? Clearly somewhere in the Corfe Hills, west of Broadstone. To understand its history, it is necessary to examine the conditions which have affected its course.

In 1923 Mr. Bury showed that the sea had once flowed over all the region of the map at a height of about 300 feet above the present sea-level, and that this must be identified with a sea-level known over much of western and southern Europe, the 100-metre or Sicilian Beach. The old flat which formed the bottom of this sea can be seen well from the main London road near Picket Post. The nearest fragments to Bournemouth are on Burley Hill and on the ridge on the Corfe Hills on which Poole reservoir stands (X on the map). It seems to have come between the two first great advances of the ice, that is, according to the latest computations, about half a million years ago.

It would seem that since then sea-level has remained little altered for long periods of mild climate, during which the rivers carved out wide flat floors. These periods were interspersed with comparatively brief cold periods when sea-level shrank, owing to abstraction of water to make ice-caps at the poles. When the ice melted, the sea rose again, but not usually to its previous height. Meanwhile the history of the Bourne was continuously mixed up with the behaviour of the larger rivers, Stour to the north and to the south the Solent river that once continued the Frome across Poole Bay. These two rivers carved from the ancient Sicilian sea-bottom a slope, which was not continuous, but built up of a series of flats, descending eastwards, separated by steeper "bluffs." These flats or "terraces" each corresponded to a fairly definite sea-level higher than the present and, as their nomenclature is probably strange to most readers, are described on the map by an estimated level, to which they are believed to be graded. Those which concern the early Bourne are the 200ft. or Upper Ambersham terrace; the 170ft. or Ambersham terrace; the 140ft. or Sleight terrace; the 100ft. or Boyn Hill terrace. They have since been much broken by streams graded to lower levels, some of which will be discussed later. A rough approximation to the actual heights of the terraces, through which the Bourne runs, can be obtained by adding the feet in the title to the height of the nearest part of the Stour. The approximate downstream limits of the remains of these terraces are shown by hatching on the map.

The first fall of sea-level, for which we have evidence, was to about 200ft. The valley floors of the Bournemouth rivers coalesced to form a broad plain, a remnant of which covers most of the Corfe Hills. The Bourne began as a stream draining the Sicilian gravels and flowing down the faint slope of the 200ft. terrace. Streams maintain their courses unless some extraneous influence affects them. There are valleys draining to Broadstone from the hills where we should expect them to be if they fed the original Bourne, and though more than 50ft. deep, they probably retain their original direction. But, close to Broadstone Station, there is an abrupt turn north and the water ultimately runs into the Stour through Canford Park.

Suppose there is a stream running directly east and near it the head of another stream running north. If the latter has some advantage over the former, such as a steeper slope, its head may cut back till it taps the easterly stream and turns its upper waters north. The tapped stream is said to be beheaded and the sharp angle formed in the new course is termed an "elbow of capture." The Broadstone occurrence is an excellent small scale example.

East of the Station is an area of high ground, part of the 170ft. terrace, standing about 240ft. above the sea. It has been much dissected by steep modern valleys, but contains two fragments of a lower flat at about 215 O.D., which appear to be relics of the floor of an ancient valley some 25ft. deep (Q and R on map). They can be seen along the Wimborne Road in the line where one would expect the early Bourne to run. The eastern fragment's greatest length lies a little west of north and continues to the cemetery, where it is cut off by a deep valley, on the opposite side of which is a col (P on map) with bits of a floor at much the same level. Continuing the line we come in half a mile to the bluff between the 200ft. and 170ft. terraces. This suggests a branch draining a former northward extension of the 200ft. platform.

Drainage from both fragments unites to cross the Poole-Wimborne Road 150 yards north of milestone, Wimborne 3. It runs south-east for another 300 yards and then turns south to drain into Holes Bay. This south-east valley is on the line which the Bourne must have taken, since no trace of a valley belonging to it is found in the escarpment of the 170ft. terrace which stretches across Canford Heath. A mile and a half to the east we come (H on the map) to the beheaded valley of the present Bourne.

The geography immediately east of Broadstone Station is, if these inferences are sound, very curious. Part of an old valley is, so to speak, left in the air, cut off at one end by a stream flowing north and at the other by a stream flowing south. A possible explanation is to be found in Mr. Bury's works. He showed that the gravels laid down by the old Solent river could be distinguished from those laid down by the Stour, and that on Canford Heath the Solent gravels were found to the north of the existing water-shed. It follows that after the 170ft. terrace was formed the water-shed moved south, and it would seem that during its progress the Canford brook beheaded the Bourne at Broadstone.

I shall refer later to the evidence that, long after the formation of the 170ft. terrace, the sea, when at a level near 50 O.D., broke into the Solent River. This brought about a fall in the water-level near what is now Poole Harbour, which I estimate at 35ft. Not only the Frome and Puddle, but every little rivulet started to cut its way back and as soon as they reached the old water-shed, which then probably ran easterly from the site of the reservoir, it would begin to move northward. Thus was shaped that steep escarpment which seems to surround Poole like a rampart; and thus the Bourne was again beheaded east of the Poole-Wimborne Road and its valley destroyed for a mile and a half across Canford Heath.

This brings us to the point H, where there is a beautiful section of the beheaded valley, here a quarter of a mile across and 50ft. deep. It is still in the 170ft. terrace, but half a mile on, it passes on to a lower terrace, the 140ft. Thus, somewhere about 400,000 years ago the Bourne was a tributary of the Solent River near Alderney Hospital. As the Solent River retreated, the Bourne extended itself across the Solent valley floor until it probably ran through Meyrick Park and Boscombe. The southern tributaries now started with drainage from the older gravels of the 170ft. terrace.

The next fall of sea-level, to 100ft. above the present, brought about the formation of the flat, averaging some 130ft. above the sea, on which most of Bournemouth is built. The sea-level remained constant, apart from a slow fall of perhaps 15ft., for a longer period than any other in which human artifacts are found. It is in the gravels of this period that flint implements are most abundant. The same is true of the 100ft. terraces of the Thames and Somme. Their formation may have lasted 200,000 years.

The bluff between the 140ft. and 100ft. terraces is the highest of the series and marks some important changes. It was mapped by Mr. Bury as the divide between Upper and Lower Plains. The courses of the streams alter their directions as they cross this bluff. Half a mile south of Talbot Village, the Bourne turns from south-east to south; a neighbouring tributary does the same; the south branch turns slightly at the Gasworks. The Branksome Valley, which continues Branksome Chine, turns from east to south-east. South of the map is the Luscombe Valley which also turns sharply south; to the north a stream which runs through East Howe and Kinson turns from east to north-east. I would interpret this as due to a change in slope of the floors of the valleys of the larger rivers, along which the minor streams were extending themselves.

The valley of the Bourne is still sunk in the 100ft. terrace when it reaches the sea at the Pier and we have no direct evidence of its former course over what is now Poole Bay. We must look for this within the valley itself. It certainly entered the next, the Iver (70ft.) terrace, a strip of which is seen on the map, but I have not been able to identify this inside the valley. Then came two linked terraces, which are of great importance in the larger river valleys and also run up the Bourne. Both these terraces belong to a sea-level about 50ft. above the present; the gravels of both contain mammoth; and both belong to the period known to archæologists as *Levallois*. Both correlate with the 50ft. or Taplow terrace of the Thames. Yet they are at different heights, one being 20ft. above the other in the Stour and Avon, and about 45ft. in the Frome. The reason is that the older and higher was formed by a tributary of the Solent River, flowing out at Spithead. Then the sea broke through between the Needles and Old Harry, so that the lower terrace went straight to the sea. This may have been about 100,000 years ago.

Only fragments remain of the older terrace in the Bourne Valley. Two somewhat degraded are seen on the Cliffs on either side of the Pier at about 70 O.D. There are examples in Suffolk Road and at the West Station. I think too that some bits near 100ft. at Wychwood School and in Meyrick Park should go with it. It is best seen just north of the railway at B on the map. Remains of the younger and lower terrace can be seen along the valley from the Exeter Hotel up to Branksome Wood Road (C on map) where it becomes a continuous terrace and makes a fine feature up to Alder Road (A on map), where it becomes the floor of the valley up to the point of beheading (H).

When there has been a fall of sea-level, at first only the part of a stream near the mouth is affected. The steepened part of the stream cuts backwards, i.e., moves upstream. The limit, where there is a sharp increase of current, is termed the "head of rejuvenation." By Alder Road is a head of rejuvenation, eating into the old valley floor, so that there is a valley within a valley. The lower floor is believed to be graded to a sea-level about 20ft. above the present, but this is somewhat uncertain, as its termination is buried below a delta. It is known as the Staverton terrace.

This part of the Bourne, between Alder Road and Coy Pond, a little south of B on the map, is interesting, because along most of it the stream has not been straightened, so that river action can be seen at work. Meanders can be seen eating into their outer banks and depositing gravel on their inner sides.

Two hundred yards above the railway embankment is another rejuvenation head (B) and, though the new formations are decidedly indistinct, some idea of what a rejuvenation head is like can be obtained. The corresponding head in the Stour is near Corfe Mullen and is on much too big a scale to see as a whole. Wimborne Minster is built on the resulting elevated terrace of the Stour.

Thus near B there is a regular staircase of terraces. The general surface is in the 100ft. In the Bourne Valley are the first 50ft., the second 50ft., the 20ft. and finally the flood-plain, which corresponds to the flood-plain between Corfe Mullen and Canford. I have called it the "Upper Buried Channel." This appears to be graded to some sea-level *below* the present, but so much has been buried under delta deposits that it is not yet possible to be definite.

A word may be said about this delta. I have called it the "Muscliff terrace," from its striking development near Muscliff, not far from Moordown. It is a prominent feature at 40 O.D. in all our Bournemouth rivers and must, as far as I can see, have run up the Bourne, but I have not yet noticed any trace of it. Closer examination may detect it.

There is a doubtful sign of a rejuvenation head where Branksome Wood Road crosses the Bourne (C), but there has been too much interference to be sure. It would correspond to the head at Canford in the Stour, which can be traced down to a terrace on which much of Christchurch is built.

When in all this long history did the break up of the ancient Bourne take place? It could not have been long ago, geologically, as the water-shed is generally only just past the line of the former stream. We do not know to what sea-level the steep slopes towards Poole are adjusted, though detailed measurements should decide. But, if we consider that there have been periods of great cold, during which erosion must have been vastly more intense than to-day, I think we may safely date it as well past the latest of these, probably not many thousands of years past.

I trust that this account of the little brook that has given its name to a great town may afford a glimpse of the possibilities for landscape research in our neighbourhood.

Obituary.

Leslie Beeching Hall, F.L.S.

The Society has suffered a grevious loss by the untimely death of Mr. Hall at the age of 67.

Coming from London more than 20 years ago, he was soon recognised as one of the most useful members of the Society in all branches of Biology, of which he was an untiring student and exponent.

As Chairman of the Botanical Section he was successful in retaining and even excelling the high standard set by his predecessors, and the weekly excursions were a source of inspiration to his fellow naturalists, who never turned to him without receiving helpful advice and assistance.

He traced his early interest in Nature to two friends at Hastings, and, during his school-days there, he laid the foundations of his life's absorbing work.

The Coleoptera were his early love, but soon his studies and investigations spread to all forms of life.

In the field he was never at a loss, for he possessed an unfailing memory, and it was a delight to hear him explain some unusual form of the living world, for he was equally at home with the Diptera, the Reptilia or the Avi-fauna. When out on rambles too, he would indicate his views on Art, Literature and Philosophy, to the delight and inspiration of his companions, giving them an insight into his tastes and character.

In his early life he was associated with his uncle, Rev. Newman Hall, and he was largely influenced in his philosophic views of life by his connection with Non-Conformist circles.

After some experience in business he married Miss Coxeter and joined the well-known firm of chemical manufacturers of that name. Here his inventive genius and manipulative skill had full scope. During the first Great War he was engaged in doing research on liquid Carbon-dioxide and Nitrous-oxide, with beneficial results.

His scientific curiosity led him to explore avenues seldom trodden by Men of Science and his observations of animal instincts paved the way for a careful investigation into psychological problems.

His æsthetic sensibility gave him intense pleasure, with the faith that Beauty and Nature could compensate for the sordid and ugly in human relations.

His last illness was borne with the patient, realistic outlook of an austere philosophy.

He died on October 28th, 1945.

F.L.L.